Final Report

A project under the Canada
New Brunswick Conservation
and Renewable Energy
Demonstration Program

COMMUTER VANPOOLING PROGRAM

NEW BRUNSWICK

DEPARTMENT OF TRANSPORTATION

POLICY BRANCH

March, 1985

CREDA Project #2002

Canada/New Brunswick Conservation and Renewable Energy Demonstration Program

The Conservation and Renewable Energy Demonstration Program Program is administered in New Brunswick by the Energy Secretariat and managed jointly with Energy, Mines and Resources Canada. The Program is designed to help demonstrate promising conservation and renewable energy technologies, to develop public awareness and understanding of these technologies, and to create employment in new or existing industries.

Through over 100 demonstration projects in New Brunswick, a wide variety of conservation and renewable energy technologies have proven to be technically sound and economically attractive. These demonstration projects should now provide a catalyst for commercialization and lead to widespread adoption of many of these proven technologies.

This final report is based on a project which was financially supported by the Energy Demonstration Program. For further information on other demonstration projects funded in New Brunswick under this program, contact:

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Programme Canada/Nouveau-Brunswick de démonstration des économies d'énergie et des énergies renouvelables

Le Programme de démonstration des économies d'énergie et des énergies renouvelables est administré au Nouveau-Brunswick par le Secrétariat à l'énergie, en collaboration avec Energie, Mines et Ressources Canada. Ce programme tente d'abord de vérifier la fiabilité des techniques de conservation d'énergie, d'accroître la sensibilité du public envers ces techniques et, enfin, de favoriser la création d'emplois au sein des industries nouvelles ou déjà existantes.

Un grand nombre de projets de démonstration se sont avérés à la fois techniquement réalisables et économiquement attrayants.

Le succès ainsi rencontré encourage la commercialisation des procédés les plus accessibles. Cela entraînerait certes l'adoption d'un grand nombre de ces techniques par les propriétaires de domiciles et par l'industrie privée.

Ce rapport final est basé sur un projet qui a reçu une aide financière du Programme de démonstration. Pour de plus amples renseignements, communiquez avec la:

Division des économies d'énergie
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D I S C L A I M E R

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EXECUTIVE SUMMARY

Application was made by the New Brunswick Department of Transportation to the Energy Secretariat for funding under the "Canada/New Brunswick Program on the Development and Demonstration of Renewable Energy and Energy Conservation Technologies" in 1980 to set up a Commuter Vanpooling Program in New Brunswick. The program was approved and four (4) vanpool services were established and subsidized at a rate of 40% of monthly van payments the first year of operation, 20% the second year, and 0% the third year. A total of $10,824.06 was paid in subsidy payments throughout the program.

The four (4) vanpool services established under this program are as follows:

(1) Mr. George Hazen - Hampton to Saint John

(2) Mr. Terry Ward - Gaspereau Forks to Fredericton

(3) Mr. William Haanstra - Minto to Grand Lake N.B. Power Plant

(4) Mr. Milton Thibodeau - Boiestown to Fredericton

Mr. Ward has completed his three (3) year contract period and is now operating a forty-four (44) passenger bus for Trius Taxi along his inital route. The other options are still in service.

These vanpool services saved over 80,000 L of gasoline through the program or over 41,000 L of fuel per year.

All four of the vanpool services have resulted in a cost/benefit ratio of 1.0 or greater, indicating that benefits were received by passengers using these vanpools.

Through this vanpool demonstration program, the public in New Brunswick has become aware of vanpooling and its benefits.

SOMMAIRE-RECOMMANDATION

En 1980, le ministère des Transports du Nouveau-Brunswick présentait une demande au Secrétariat à l'énergie en vertu du "Programme Canada/Nouveau-Brunswick de développement et de démonstration des technologies d'économies de l'énergie et d'utilisation des énergies renouvelables" en vue de financer la mise en oeuvre d'un programme de transport collectif par camionnette au Nouveau-Brunswick. Le programme a été approuvé et quatre (4) services de transport collectif furent mis sur pied et financés selon un pourcentage de 40% des mensualités pour l'achat des camionnettes au cours de la première année d'exploitation, 20% la deuxième année et aucune subvention la troisième année. Au total, 10 824,06 $ ont été versés en subventions pendant toute la durée du programme.

Les quatre (4) services de transport collectif qui ont été établis en vertu de ce programme sont les suivants:

(1) M. George Hazen - Hampton à Saint-Jean

(2) M. Terry Ward - Gaspereau Forks à Fredericton

(3) M. William Haanstra - Minto aux installations d'Energie N.-B. au Grand Lac

(4) M. Milton Thibodeau - Boiestown à Fredericton

M. Ward a rempli son contrat de trois ans et exploite maintenant un autobus de quarante-quatre (44) passagers pour Trius Taxi sur son itinéraire initial. Les autres services fonctionnent toujours.

Ces services de transport collectif par camionnette ont permis d'économiser 80 000 L d'essence pendant la durée du programme, soit plus de 41 000 L par année.

Les quatre services ont présenté un rapport coût/avantage de 1,0 ou plus, ce qui signifie que les usagers de ce service en ont tiré des avantages personnels.

Ce programme de démonstration a permis de sensibiliser la population au transport collectif par camionnette au Nouveau-Brunswick et à ses avantages.

1.0 INTRODUCTION AND BACKGROUND

A Federal-Provincial Program to promote innovative energy technology was announced in 1980 under the title "Canada/New Brunswick Program on the Development and Demonstration of Renewable Energy and Energy Conservation Technologies". An application was submitted to the Energy Secretariat by the New Brunswick Department of Transportation listing a number of proposed programs, one of which was vanpooling. The vanpooling program was approved under this program.

The Policy Branch of the New Brunswick Department of Transportation was responsible for administering the vanpooling program. Ads were run in both the French and English newspapers to seek interested individuals who would eventually participate in this program. Numerous requests for information were received by mail and phone. However, few applications were received. After a phone survey of those who requested information, it was found that individuals did not want to become involved because:

(1) there was a perception of too much government control,

(2) there were perceived problems with income tax,

(3) the subsidy offered was not high enough.

Initially, the subsidy money available to approved vanpools was based on their monthly van payments (less tax) at a rate of 20% the first year, 10% the second year and 0% the third year. As a result of this negative reaction by

the public, the vanpooling program was reviewed. Following this review, the commuter vanpooling booklet was redone, the subsidy payments were increased to 40% the first year, 20% the second year, and 0% the third year, the application forms were simplified, and the Motor Carrier Act was amended in 1982 to exempt vanpools from provisions of the Act.

Prior to the announcement of the Energy Conservation and Renewable Energy Program, a vanpool service with assistance from the Federal and Provincial governments was begun by Mr. Terry Ward between Gaspereau Forks and Fredericton.[1] As a result Mr. Ward's vanpool service was grandfathered to permit subsidization under this vanpooling program. This was done to ensure the continuation of Mr. Ward's vanpool. Mr. Ward began his service in April, 1980. Three (3) other vanpool services were approved under this program.

1) Mr. George Hazen - Hampton to Saint John, 100 km daily round trip;
2) Mr. William Haanstra - Minto to Grand Lake Power Generating Plant, 34 km daily round trip; and
3) Mr. Milton Thibodeau - Boiestown to Fredericton, 150 km daily round trip.

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[1] Federal/Provincial Vanpool Demonstration Project, Gaspereau Forks - Fredericton, New Brunswick, New Brunswick Department of Transportation, Policy Division, July, 1981.

It was anticipated that these four vanpool operations would prove viable in the long term for both the owner/operator and passengers and continue after the three year contract period. It was also anticipated that these vanpools would demonstrate to others the benefits of vanpooling and prove that this method of commuting to and from work is economical, comfortable, safe and energy efficient.

2.0 DESCRIPTION OF VANPOOL SERVICES

Each of the four (4) vanpool services were independently owned and operated. Each service was tailored to the specific needs of the owner/operator and his passengers. Although the operations are similar there are subtle but important differences.

2.1 Mr. George Hazen - Hampton Area to Saint John

The vanpool service operated by Mr. Hazen transports eleven (11) passengers from Hampton area to Saint John, a distance of approximately 100 km per day.

Mr. Hazen operates his vanpool service with a 1981, 12-passenger Ford van. (See Appendix A) This service was approved and subsidized under the Commuter Vanpooling Program in September, 1981.

Prior to the operation of this vanpool service, Mr. Hazen operated a similar service for 1 1/2 years.

2.2 Mr. Terry Ward - Chipman Area to Fredericton

Mr. Terry Ward was given approval under the New Brunswick Vanpooling Program to operate a vanpool service from Chipman to Fredericton in April, 1980. Mr. Ward transported fourteen (14) passengers per day to and from work resulting in a 168 km round trip per day. The van used in this vanpool service was a 15-passenger Dodge van. (See Appendix A)

Prior to the establishment of this vanpool service, each passenger travelled individually or in groups of three. Upon the completion of the vanpool agreement (March 31, 1983) Mr. Ward continued to operate the vanpool service until September, 1983. At this time, Trius Taxi Ltd. placed a 44-passenger bus in service for commuters. Mr. Ward is employed by Trius Taxi Ltd. as the driver.

2.3 Mr. William Haanstra - Minto Area to Grand Lake Power Plant

The vanpool service operated by Mr. Haanstra under the New Brunswick Vanpooling Agreement began operation in October, 1981. Mr. Haanstra operates his service with a 1978, 11-passenger Dodge van. (See Appendix A) This route results in a 34 km round trip per day. A used van was approved for this service because of the relatively short haul and the need to minimize fares.

For approximately 1 1/2 years, prior to the establishment of this vanpool service, each passenger drove his own vehicle to work. Previous to this, a vanpool service had operated for a period of six years.

2.4 Mr. Milton Thibodeau - Bloomfield to Fredericton

The vanpool service operated by Mr. Thibodeau began operation under the New Brunswick Vanpool Agreement in September, 1983.

Mr. Thibodeau's vanpool service operates from Bloomfield (near Boiestown) to Fredericton each working day and covers 150 km per day. The van used in this service is a 1984, 15-passenger Dodge van. (See Appendix A)

Prior to the operation of this particular vanpool service, two (2) privately owned vans had been operating for nine (9) years. Mr. Thibodeau had been a driver in one of these two vans. Currently, one other privately owned van is operating separately from Mr. Thibodeau's vanpool service on this same route.

3.0 OBSERVATIONS DURING VANPOOL'S OPERATIONS

To date, all of the four (4) vanpool services have not run into any major problem that would result in the cancellation of a vanpool service. In the following sections, each vanpool service will be discussed in terms of drivers comments and fuel savings. A summary of the fuel savings is listed in Table 1.

3.1 Mr. George Hazen

The 1981 Ford van used in this vanpool service had been operating with minimal amount of repairs until March, 1984. In March work was required to replace the timing chain, heater core and the carburator was rebuilt.

The side-sliding door which is used as the main exit and entrance to the passenger seats, is too heavy to be closed by the female passengers, according to Mr. Hazen. He would recommend double hinged doors for others considering operating vanpools.

Mr. Hazen has maintained more than a 90% load factor to date. He finds it difficult to maintain a current waiting list, as many people who contact him about a ride want to start immediately rather than wait until an occupancy occurs.

Mr. Hazen's Ford van has averaged 29.8 L/100 km and has travelled 66,000 km to date, resulting in the consumption of 19,668 L of gasoline. (See Appendix B) If passengers were grouped in pairs and drove their own vehicles, fuel consumption would result in 34,520 L of gasoline. Thus, fuel savings has been estimated to exceed 14,800 L of fuel.

3.2 Mr. Terry Ward

During the operation of Mr. Ward's vanpool service, the only major repair required was the replacement of the front tires after less than 16,000 km.

More problems that occurred were related to passenger comfort. Passengers complained that the van was too hot in the summer. A roof vent was installed and alleviated some of this problem. Some of the rear-seated passengers complained of it being too hot during the winter months as they were seated over the auxiliary heater. This related to the vehicle design and was not able to be corrected.

Through Mr. Ward's vanpool service, over 36,000 L of fuel was saved.[1] The van fuel consumption was approximately 31,000 L of fuel and the individual vehicle consumption would have been approximately 67,000 L of fuel. (See Appendix B)

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[1] Beaulieu, Rino, "The Fredericton - Gaspereau Forks Vanpool Demonstration Project", October, 1983, p. 10.

3.3 Mr. William Haanstra

Mr. Haanstra opted to use a 1978 Dodge van for his vanpool service. Mr. Haanstra indicated that the only problem with his van to date is the current rusty condition of the van body.

Fuel consumption for the van to date has been over 3,000 L. For individual vehicles it would have been approximately 14,000 L of fuel consumption. (See Appendix B) The resulting energy savings is over 11,000 L of fuel.

3.4 Mr. Milton Thibodeau

In Mr. Thibodeau's vanpool service, a 1984 Dodge van was selected. To date, the van has been in operation for nine (9) months. During this period one problem was encountered, and that was with the poor circulation of heat during the winter months. Another comment was made about the lack of power on grades, although this van has the largest engine available.

A problem which relates to the vehicle design is the side doors are located too far ahead. This inconveniences passengers that have to move to and from the rear seats.

Fuel consumption during the nine (9) months of operation has been less than 7,000 L. Individual passenger vehicle fuel consumption would have been approximately 22,000 L of fuel. (See Appendix B) The resulting fuel saving has exceeded 15,000 L.

TABLE 1

SUMMARY OF FUEL SAVINGS TO MAY 31, 1984 AND PER YEAR

Van Operator	Months of Operation	Total*** Van Kilometres	Van* Fuel Usage(L)	Passenger** Kilometres	Estimated* Passenger Vehicle Fuel Usage(L)	Fuel* Savings as of May 31/84(L)	Average Fuel Savings Per Year(L)
Hazen	33	66,000	19,668	611,520	34,520	14,852	5,400
Ward	36	133,200	31,306	1,364,476	67,539	36,233	12,077
Haanstra	31	13,950	3,279	128,512	14,509	11,230	4,347
Thibodeau	9	29,250	6,874	389,340	21,979	15,105	20,140
TOTAL						77,420	41,964

* Calculated in Appendix E
** Calculated in Appendix G
*** From Appendix F

4.0 COST/BENEFIT ANALYSIS

Through the operation of the four (4) vanpool services, substantial savings in fuel consumption were achieved, as shown on Table 1 and amounting to over 77,000 L. In terms of dollar value, this would be approximately $38,700.00 based on fuel prices of $0.50/litre.

Suggested fare structures for each of the four (4) vanpool services aredescribedin Appendix C. These fares determine the breakeven point for the operator and were used as a guide to determine reasonable passenger fares. Mr. Hazen chose a flat rate of $18.00 per week and the fare for his operation has remained constant since the beginning of his service. Mr. Ward charged a fixed rate plus so much a kilometre. Mr. Ward's rate per month averaged $65.00 for the duration of the project. Mr. Haanstra fixed his fares at $10.00 per week and has remained constant to date. Mr. Thibodeau decided to group passengers into three (3) different levels based on distance with those living furthest from work paying the most. His rates have been $17.50, $18.00 and $18.50 depending on the distance to work.

The formula for calculating the government subsidy is based on the monthly van payments (less sales tax) at a rate of 40% the first year, 20% the second year and 0% for the third year. These figures are listed in Table 2. The Provincial/Federal Governments paid out $10,824.06 in subsidy payments through this program.

TABLE 2

SUMMARY OF SUBSIDY PAYMENTS

Van Driver	Monthly Payments $	40% Sub. Year 1 $	20% Sub. Year 2 $	Total $
Hazen	432.48	2,075.90	1,037.95	3,113.85
Ward	401.39	1,926.68	963.34	2,890.02
Haanstra	109.95	916.56	458.28	1,374.84
Thibodeau	478.52	2,296.90	1,148.45	3,445.35
TOTAL				$10,824.06

Appendix D gives details on passenger participation and cost data. It can be seen from this data that for all four (4) vanpool services that there has been a low turnover of passengers, thus indicating their satisfaction with the vanpool service.

Mr. Thibodeau began operation of his vanpool service as he felt he could provide transportation to individuals at a cheaper rate than private vans operating along the same route. He reduced the weekly passenger rates by an average of $6.90 over previous rates and provided a service in a new vehicle. The service at the higher rate uses a van which is several years old.

5.0 CONCLUSIONS

From analyzing each of the four (4) vanpool services, it can be concluded that the New Brunswick Vanpooling Commuter Program was a success. Four (4) vanpool operations were established which conserved fuel and proved more economic for their passengers than using cars. The program was also successful in educating the public in the province about vanpooling and the benefits it can offer commuters.

Although the government subsidy was increased from 20% the first year, 10% the second year and 0% the third year, to 40%, 20% and 0%, respectively, the program was unsuccessful in establishing a large number of vanpool services.

Through this vanpooling program it was learned that there are numerous vanpools in existence in the province today. Ride-sharing by other mechanisms is also popular. The extent of ride-sharing was not identified.

It was concluded that the majority of the commuting public in New Brunswick wanted the flexibility of using their own automobiles for driving to and from work. There exists a substantial potential for further stimulation of ride-sharing because sole occupant vehicles are still the predominent method used for commuting.

6.0 RECOMMENDATIONS

The following recommendations are made as a result of this study:

(1) Manufacturers should redesign vans to overcome the following problems which were consistently identified by operators:

a. location and type of side doors

b. dispersement of heat from auxiliary heater

c. poor ventilation in summer

d. inadequate or poor heating system for winter.

(2) General information on vanpooling should continue to be made available to the public. Funds would be required to produce general documentation, posters, etc.

(3) Further mechanisms should be investigated for stimulating energy efficient ride-sharing in New Brunswick.

(4) A detailed study should be carried out on the extent of ride-sharing existing in New Brunswick.

APPENDICES

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APPENDIX A

VAN SPECIFICATIONS

GEORGE HAZEN - VAN SPECIFICATIONS

1981 - 11 Passenger Ford Van

- 351 - 4BBL V8 Engine
- Automatic Transmission
- Double Rear Doors
- Sliding Side Door
- Heavy Duty Shocks and Suspension
- Heavy Duty Battery and Alternator
- Auxiliary Rear Heater
- Radio
- Dual Gas Tank
- Power Steering
- Power Brakes

TERRY WARD - VAN SPECIFICATIONS

1980 - 15 Passenger Dodge Maxiwagon B300

- 360 - 2BBL V8 Engine
- Automatic Transmission
- Single Rear Door with Vented Glass
- G.V.W. - 8550 lbs.
- Custom Interior
- Standard Tires (Winter Rear - Summer Front)
- Shoulder Belts - Driver and other Front
- Heavy Duty Insulation Package
- Dual Low Mount Mirrors
- Auxiliary Rear Heater
- Day/Night Mirror
- Heavy Duty Alternator
- Heavy Duty Battery
- Tinted Glass on the Sides
- Power Steering
- Spare Rim and Summer Spare
- Radio
- Switches - Door Lamp
- Scuff Pads on the Door Area
- IW Warranty
- Dual Horns
- High Output Heater

WILLIAM HAANSTRA - VAN SPECIFICATIONS (Used Van)

1978 - 11 Passenger Dodge Van

- 360 - 2BBL V8 Engine
- 3/4 Ton Chassis
- Automatic Transmission
- Power Brakes
- Power Steering
- Double Side Doors
- Rear Double Door
- Radio

MILTON THIBODEAU - VAN SPECIFICATIONS

1984 - 15 Passenger Dodge Van

- 360 - 4BBL V8 Engine
- 8510 lb. GVWR
- Automatic Transmission
- Power Brakes
- Power Steering
- 8.76 x 16.5E Polyester Bias Belted Tires
- 500 Amp. Battery
- Deluxe Wipers
- Aux. Rear Heater
- AM Radio
- 6 x 9 Low Mount Minors
- Gauges - Oil, Trip, Amp, Temp
- Roof Vent
- Block Heater
- Single Rear Door
- Double Side Doors

APPENDIX B

FUEL SAVINGS AND CONSUMPTION

GEORGE HAZEN - FUEL SAVINGS AND CONSUMPTION

Actual Data Provided by Operator:

2 People/Vehicle

Vehicle Fuel Consumption = 11.29 L/100 km (25 mpg)

Vehicle Fuel Consumption

Total Passenger Kilometres = 611,520 km

Total Vehicle Kilometres = 611,520/2 = 305,760 km

Vehicle Fuel Consumption = 305,760 x 11.29 L/100 km

= 34,520 L

Van Fuel Consumption

Total Van Kilometres = 2,000 km x 33 MTHS = 66,000 km

Van Fuel Consumption = 66,000 x 29.8 L/100 km

= 19,668 L

Fuel Savings

34,520
- 19,668
14,852 L

TABLE 2

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Haanstra	109.95	916.56	458.28	1,374.84
Thibodeau	478.52	2,296.90	1,148.45	3,445.35
TOTAL				$10,824.06

The cost/benefit ratio is defined as the amount it would cost individuals to use his/her own vehicle divided by the charge for individuals to use the vanpool service. A ratio greater than one indicates a benefit was received by the vanpool service. A ratio of one or less indicantes no benefits. However, these cost values include only fuel costs and do not take into account depreciation and the wear and tear on these private vehicles. The values used in this ratio calculation are taken from columns 6 and 7, excluding new employees, in Appendix D. Mr. Hazen's cost/benefit (C/B) ratio is 1.0; Mr. Ward's C/B ratio is 1.31; Mr. Haanstra's C/B ratio is 1.10; and Mr. Thibodeau's C/B ratio is 1.48. It is noteworthy that both Mr. Ward's and Mr. Thibodeau's services are considered the most successful because of high load factors and waiting lists. These services also have the highest C/B ratios.

TERRY WARD - FUEL SAVINGS AND CONSUMPTION

Actual Data Provided by Operator:

2.28 People/Vehicle

Vehicle Fuel Consumption = 11.29 L/100 km (25 mpg)

Vehicle Fuel Consumption

Total Passenger Kilometres = 1,364,476 km

Total Vehicle Kilometres = 1,364,476/2.28 = 598,220 km

Vehicle Fuel Consumption = 598,220 x 11.29 L/100 km

= 67,539 L

Van Fuel Consumption

Total Van Kilometres = 3,700 km x 36 MTHS = 133,200 km

Van Fuel Consumption = 133,200 x 23.5 L/100 km

= 31,302 L

Fuel Savings

67,539
- 31,302
36,237 L

TABLE 2

SUMMARY OF SUBSIDY PAYMENTS

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= 67,539 L

Van Fuel Consumption

Total Van Kilometres = 3,700 km x 36 MTHS = 133,200 km

Van Fuel Consumption = 133,200 x 23.5 L/100 km

= 31,302 L

Fuel Savings

67,539
- 31,302
36,237 L

WILLIAM HAANSTRA - FUEL SAVINGS AND CONSUMPTION

Actual Data Provided by Operator:

1 Person/Vehicle

Vehicle Fuel Consumption = 11.29 L/100 km (25 mpg)

Vehicle Fuel Consumption

Total Passenger Kilometres = 128,512 km

Total Vehicle Kilometres = 128,512 km

Vehicle Fuel Consumption = 128,512 x 11.29 L/100 km

= 14,509 L

Van Fuel Consumption

Total Van Kilometres = 450 x 31 MTHS = 13,950 km

Van Fuel Consumption = 13,950 x 23.5 L/100 km

= 3,279 L

Fuel Savings

$$\begin{array}{r} 14{,}509 \\ -\ 3{,}279 \\ \hline 11{,}230 \text{ L} \end{array}$$

MILTON THIBODEAU - FUEL SAVINGS AND CONSUMPTION

Actual Data Provided by Operator:

2 People/Vehicle

Vehicle Fuel Consumption = 11.29 L/100 km (25 mpg)

Vehicle Fuel Consumption

Total Passenger Kilometres = 389,340 km

Total Vehicle Kilometres = 389,340/2 = 194,670 km

Vehicle Fuel Consumption = 194,670 x 11.29 L/100 km

= 21,979 L

Van Fuel Consumption

Total Van Kilometres = 3,250 km x 9 MTHS = 29,250 km

Van Fuel Consumption = 29,250 x 23.5 L/100 km

= 6,874 L

Fuel Savings

$$\begin{array}{r} 21,979 \\ -\ 6,874 \\ \hline 15,105 \text{ L} \end{array}$$

APPENDIX C

FARE CALCULATIONS

MILTON THIBODEAU - FARE CALCULATIONS

For September 1, 1983

	Passenger List	Kilometres
(1)	Driver/Co-ordinator - Milton Thibodeau	75
(2)	Backup Driver - Keith Gilks	60
(3)	Ann Norrad	75
(4)	Mable Carson	75
(5)	Ann Carson	75
(6)	Carole Fairley	75
(7)	Bertha Fairley	75
(8)	Sheree Norrad	71
(9)	Ellamae Calhoun	75
(10)	Merva Price	61
(11)	Gordon Black	67
(12)	Diane Munn	63
(13)	Cathy Case	62
(14)	Terry Black	60
(15)	Nora Astle	61
	TOTAL KILOMETRES	1,030

Based on Passenger List

One way seat km production per day =		1,030
Additional 3 km for city driving =		45
	TOTAL	1,075 km
Total Monthly Seat km's (1,075 x 21 x 2)=		45,150 km

Variable Costs

Gasoline - 23.5 L/100 km $0.53/L	12.46¢/km
Tires - $400.00/set every 24,000 km	1.67¢/km
Tune-Up - Gas Filter, Air Filter, etc.	0.42¢/km
Oil, Oil Filter, etc. - $18.00/8,000 km	0.23¢/km
Alignment - $35.00/16,000 km	0.22¢/km
TOTAL	15.00¢/km

MILTON THIBODEAU - FARE CALCULATIONS (Continued)

Monthly Van Kilometres (75 x 2 x 21)	3,150 km
Allowance for Town Driving (round to 3,250)	3,250 km
Monthly Variable Cost (3,250 x 15.00)	$487.50
Use	$488.00

$$\text{Variable Cost/Seat km} = \frac{\text{Monthly Variable Cost}}{\text{Monthly Seat Kilometres}}$$

$$= \frac{\$488.00}{45,150} = 1.08¢/km$$

To allow for increasing fuel cost 1.2¢/km will be used.

Fixed Costs

Van Payment	$478.52
Van Registration ($60.00/12)	5.00
Insurance $1,092.00/12	91.00
	$574.52

Costing based on 14 seats.

$$\text{Fixed Cost/Seat} = \frac{574.52}{14} = \$41.04$$

Use $41.25

WILLIAM HAANSTRA - FARE CALCULATIONS

For October 1, 1981

	Passenger List	Kilometres
(1)	Driver/Co-ordinator - William Haanstra	10
(2)	Backup Driver - Gill Boudreau	10
(3)	Jackie Smith	10
(4)	Steve Mazerolle	9
(5)	Willard Morrison	9
(6)	Leonard Roubishaud	9
(7)	Donny Savoy	8
(8)	Curbie Connell	8
(9)	Tim Lynch	8
(10)	G. Maston	8
(11)	Tom Arnold	8
	TOTAL KILOMETRES	97

Based on Passenger List

One way seat km production per day	=	97
Additional 1 km for city driving	=	11
	TOTAL	108 km

Total Monthly Seat km's (108 x 21 x 2) = 4,536 km

Variable Costs

Gasoline - 23.5 L/100 km $0.389/L	9.15¢/km
Tires - $400.00/set every 32,000 km	1.25¢/km
Tune-Up - Gas Filter, Air Filter, etc.	0.42¢/km
Oil, Oil Filter, etc. - $18.00/8,000 km	0.23¢/km
Alignment - $35.00/16,000 km	0.22¢/km
TOTAL	11.27¢/km

WILLIAM HAANSTRA - FARE CALCULATIONS (Continued)

Monthly Van Kilometres (10 x 2 x 21)	420 km
Allowance for Town Driving (round to 450)	450 km
Monthly Variable Cost (450 x 11.27)	$50.72
Use	$51.00

$$\text{Variable Cost/Seat km} = \frac{\text{Monthly Variable Cost}}{\text{Monthly Seat Kilometres}}$$

$$= \frac{\$51.00}{4{,}536} = 1.13¢/km$$

To allow for increasing fuel cost 1.25¢/km will be used.

Fixed Costs

Van Payment	$190.95
Van Registration ($60.00/12)	5.00
Insurance ($500.00/12)	41.67
	$237.62

Costing based on 10 seats.

$$\text{Fixed Cost/Seat} = \frac{237.62}{10} = \$23.76$$

Use $24.00

TERRY WARD - FARE CALCULATIONS

For April 1, 1980

Passenger List	Kilometres
(1) Driver/Co-ordinator - Terry Ward	84
(2) Backup Driver - Linda Ward	84
(3) Backup Driver - Janet Kelly	84
(4) Sharon Hiltz	45
(5) Jean MacFarlane	50
(6) Wanda Kennedy	50
(7) Sandra Fulton	50
(8) Ruth Drost	61
(9) Mona Higgins	76
(10) Rhonda Pollock	76
(11) Avis Pyne	76
(12) Lorna Hopkins	79
(13) Lorna Bailey	51
(14) Karen Kowalski	50
(15) Lucinda Small	50
TOTAL KILOMETRES	966

Based on Passenger List

One way seat km production per day =		966
Additional 3 km for city driving =		45
	TOTAL	1,011 km

Total Monthly Seat km's (1,011 x 21 x 2)= 42,462 km

Variable Costs

Gasoline - 23.5 L/100 km $0.255/L	6.00¢/km
Tires - $400.00/set every 24,000 km	1.67¢/km
Tune-Up - Gas Filter, Air Filter, etc.	0.42¢/km
Oil, Oil Filter, etc. - Chrysler free for 2 years or 40,000 km	-
Alignment - $35.00/16,000 km	0.22¢/km
TOTAL	8.31¢/km

TERRY WARD - FARE CALCULATIONS (Continued)

For April 1, 1980

Monthly Van Kilometres (84 x 2 x 21)	3,528 km
Allowance for Town Driving (round to 3,700)	3,700 km
Monthly Variable Cost (3,700 x 8.31)	$307.47
Use	$310.00

$$\text{Variable Cost/Seat km} = \frac{\text{Monthly Variable Cost}}{\text{Monthly Seat Kilometres}}$$

$$= \frac{\$310.00}{42,462} = 0.08¢/km$$

To allow for increasing fuel cost 1.0¢/km will be used.

Fixed Costs

Van Payment	$401.39
Van Registration	5.83
Insurance	47.50*
	$454.72

Costing based on 13 seats.

$$\text{Fixed Cost/Seat} = \frac{454.72}{13} = \$34.98$$

Use $35.00

* Insurance cost was actually $59.17. Calculation was based on an estimated premium.

TERRY WARD - FARE CALCULATIONS

For July 1, 1981

	Passenger List	Kilometres
(1)	Driver/Co-ordinator - Terry Ward	84
(2)	Backup Driver - Linda Ward	84
(3)	Backup Driver - Janet Kelly	76
(4)	Sharon Hiltz	45
(5)	Jean MacFarlane	50
(6)	Cathy Madore	76
(7)	Sandra Fulton	50
(8)	Ruth Drost	61
(9)	Bette Lou Garvey	63
(10)	Rhonda Pollock	76
(11)	Avis Pyne	76
(12)	Lorna Hopkins	79
(13)	Lorna Bailey	51
(14)	Barbara Bailey	51
(15)	Laurie Bishop	76
	TOTAL KILOMETRES	998

Based on Passenger List

One way seat km production per day =		998
Additional 3 km for city driving =		45
	TOTAL	1,043 km
Total Monthly Seat km's (1,043 x 21 x 2)=		43,806 km

Variable Costs

Gasoline - 23.5 L/100 km $0.389/L	9.15¢/km
Tires - $400.00/set every 32,000 km	1.25¢/km
Tune-Up - Gas Filter, Air Filter, etc.	0.42¢/km
Oil, Oil Filter, etc. - $18.00/8,000 km	0.23¢/km
Alignment - $35.00/16,000 km	0.22¢/km
TOTAL	11.27¢/km

TERRY WARD - FARE CALCULATIONS (Continued)

For July 1, 1981

Monthly Van Kilometres (84 x 2 x 21)	3,528 km
Allowance for Town Driving (round to 3,700)	3,700 km
Monthly Variable Cost (3,700 x 11.27)	$416.99
Use	$417.00

$$\text{Variable Cost/Seat km} = \frac{\text{Monthly Variable Cost}}{\text{Monthly Seat Kilometres}}$$

$$= \frac{\$417.00}{43,850} = 1.00¢/km$$

To allow for increasing fuel cost 1.12¢/km will be used starting July 1, 1981.

Fixed Costs

Van Payment	$361.25
Van Registration ($62.00/12)	5.17
Insurance ($582.00/12)	48.50
	$414.92

Costing based on 13 seats.

$$\text{Fixed Cost/Seat} = \frac{414.92}{13} = \$31.92$$

Use $32.00

GEORGE HAZEN - FARE CALCULATIONS

For September 1, 1981

Passenger List	Kilometres
(1) Driver/Co-ordinator - George Hazen	45
(2) Backup Driver - Wendy Hazen	45
(3) Backup Driver - John Dunklee	40
(4) Harry McCleave	42
(5) Lynne Jackson	45
(6) Scott Seely	45
(7) Garth Estey	40
(8) Steve Curbishley	40
(9) Jane Holder	40
(10) Charles Proctor	40
(11) Brian Hazen	45
(12) Elaine Kelly	40
TOTAL KILOMETRES	507

Based on Passenger List

One way seat km production per day	=	507
Additional 3 km for city driving	=	36
	TOTAL	543 km
Total Monthly Seat km's (543 x 21 x 2)	=	22,806 km
	Use	22,850 km

Variable Costs

Gasoline - 29.8 L/100 km $0.380/L	11.33¢/km
Tires - $400.00/set every 32,000 km	1.25¢/km
Tune-Up - Gas Filter, Air Filter, etc.	0.42¢/km
Oil, Oil Filter, etc. - $18.00/8,000 km	0.23¢/km
Alignment - $35.00/16,000 km	0.22¢/km
TOTAL	13.45¢/km

GEORGE HAZEN - FARE CALCULATIONS (Continued)

For September 1, 1981

Monthly Van Kilometres (45 x 2 x 21)	1,890 km
Allowance for Town Driving (round to 2,000)	2,000 km
Monthly Variable Cost (2,000 x 13.45)	$269.00
Use	$269.00

$$\text{Variable Cost/Seat km} = \frac{\text{Monthly Variable Cost}}{\text{Monthly Seat Kilometres}}$$

$$= \frac{\$269.00}{22,850} = 1.18¢/km$$

To allow for increasing fuel cost 1.30¢/km will be used.

Fixed Costs

Van Payment	$432.48
Van Registration ($60.00/12)	5.00
Insurance ($524.00/12)	43.67
Parking Fee	25.00
	$506.15

Costing based on 11 seats.

$$\text{Fixed Cost/Seat} = \frac{506.15}{11} = \$46.01$$

Use $46.25

GEORGE HAZEN - FARE CALCULATIONS

For September 1, 1982

Passenger List	Kilometres
(1) Driver/Co-ordinator - George Hazen	45
(2) Backup Driver - Wendy Hazen	45
(3) Backup Driver - John Dunklee	40
(4) Harry McCleave	42
(5) Brian Hazen	45
(6) Charles Proctor	40
(7) Steve Curbishley	40
(8) Scott Seely	45
(9) Barbara Reid	40
(10) Dana Bradshaw	40
(11) Brent Johnson	40
(12) Garth Estey	40
TOTAL KILOMETRES	502

Based on Passenger List

One way seat km production per day	=	502
Additional 3 km for city driving	=	36
	TOTAL	538 km
Total Monthly Seat km's (538 x 21 x 2)	=	22,596 km
	Use	22,600 km

Variable Costs

Gasoline - 29.8 L/100 km $0.442/L	13.17¢/km
Tires - $400.00/set every 32,000 km	1.25¢/km
Tune-Up - Gas Filter, Air Filter, etc.	0.42¢/km
Oil, Oil Filter, etc. - $18.00/8,000 km	0.23¢/km
Alignment - $35.00/16,000 km	0.22¢/km
TOTAL	15.29¢/km

GEORGE HAZEN - FARE CALCULATIONS (Continued)

For September 1, 1982

Monthly Van Kilometres (45 x 2 x 21)	1,890 km
Allowance for Town Driving (round to 2,000)	2,000 km
Monthly Variable Cost (2,000 x 15.29)	$305.80
Use	$306.00

$$\text{Variable Cost/Seat km} = \frac{\text{Monthly Variable Cost}}{\text{Monthly Seat Kilometres}}$$

$$= \frac{\$306.00}{22{,}600} = 1.36¢/km$$

To allow for increasing fuel cost 1.45¢/km will be used.

Fixed Costs

Van Payment	$432.48
Van Registration ($60.00/12)	5.00
Insurance ($524.00/12)	43.67
Parking Fee	32.00
	$513.15

Costing based on 11 seats.

$$\text{Fixed Cost/Seat} = \frac{513.15}{11} = \$46.65$$

Use $46.75

APPENDIX D

PASSENGER PARTICIPATION AND COST DATA

GEORGE HAZEN
September 1, 1981 - May 31, 1984

PASSENGER PARTICIPATION AND COST DATA

PASSENGER NUMBER	DAILY RETURN DISTANCE	PARTICIPATION		PASSENGER KILOMETRES	PREVIOUS TRAVEL COST PER WEEK	COST WITHOUT VANPOOL PROJECT ($\frac{DAYS}{5}$) x COST/WEEK	ACTUAL COST USING THE VANPOOL PROJECT	SAVINGS NO VAN LESS VAN	SAVING PER WEEK
	Km	MONTHS	DAYS	Km x DAYS	$	$	$	$	$
1	90	33	693	62,370	18.00	2,494.80	2,494.80	ø	ø
2	90	33	693	62,370	18.00	2,494.80	2,494.80		
3	90	28	588	52,920	18.00	2,116.80	2,116.80		
4	80	15	315	25,200	18.00	1,134.00	1,134.00		
5	84	15	315	26,460	18.00	1,134.00	1,134.00		
6	90	3	63	5,670	18.00	226.80	226.80		
7	90	33	693	62,370	18.00	2,494.80	2,494.80		
8	80	15	315	25,200	18.00	1,134.00	1,134.00		
9	80	31	651	52,080	18.00	2,343.60	2,343.60		
10	80	6	126	10,080	18.00	453.60	453.60		
11	80	24	504	40,320	18.00	1,814.40	1,814.40		
12	80	32	672	53,760	18.00	2,419.20	2,419.20		
13	80	32	662	53,760	**	-	-		
14	80	21	441	35,280	**	-	-		
15	80	12	252	20,160	**	-	-		
16	80	6	126	10,080	**	-	-		
17	80	4	84	6,720	**	-	-		
18	80	4	84	6,720	**	-	-		
TOTAL				611,520		20,260.80	20,260.80	$ ø	$ ø

$\bar{x} = ø$

ASSUME: 21 DAYS / MONTH

★ USED THEIR OWN VEHICLE PRIOR TO VANPOOL PROJECT

★★ NEW EMPLOYEES

TERRY WARD
April 1980 to April 1983

PASSENGER PARTICIPATION AND COST DATA

PASSENGER NUMBER	DAILY RETURN DISTANCE	PARTICIPATION		PASSENGER KILOMETRES	PREVIOUS TRAVEL COST PER WEEK	COST WITHOUT VANPOOL PROJECT $\left(\frac{DAYS}{5}\right)$ x COST/WEEK	ACTUAL COST USING THE VANPOOL PROJECT	SAVINGS NO VAN LESS VAN	SAVING PER WEEK
	Km	MONTHS	DAYS	Km x DAYS	$	$	$	$	$
1	167	36	744	124,248	*		2,612		
2	158	36	744	117,552	*		2,521		
3	151	36	744	112,344	*		2,468		
4	151	32	659	99,509	20	2,636	2,216	420	3.19
5	151	11	225	33,975	20	900	689	211	4.69
6	151	35	724	109,324	20	2,896	2,388	508	3.51
7	122	25	515	62,830	20	2,060	1,482	578	5.61
8	103	36	744	76,632	20	2,976	2,034	942	6.33
9	98	11	229	22,442	20	916	623	293	6.40
10	98	36	744	72,912	*		2,000		
11	151	32	664	100,264	20	2,656	2,184	4.72	3.66
12	98	16	331	32,438	*		850		
13	98	6	125	12,250	20	500	323	1.77	7.08
14	90	36	744	66,960	20	2,976	1,918	1,058	7.11
15	151	2	41	6,191	**		101		
16	151	7	144	21,744	*		475		
17	126	21	437	55,062	20	1,748	1,390	358	4.10
18	151	29	597	90,147	*		2,062		
19	103	11	229	23,587	**		674		
20	151	5	101	15,251	20	404	352	52	2.57
21	142	11	228	32,376	20	912	839	73	1.60
22	151	4	84	12,684	20	336	320	16	0.95
23	103	30	619	63,757	**		1,738		
TOTAL				1,364,476		$21,916	$16,758	$ 5,158	$ 56.80

$\bar{x}$ 4.37

ASSUME: 21 DAYS / MONTH

★ USED THEIR OWN VEHICLE PRIOR TO VANPOOL PROJECT

★★ NEW EMPLOYEES

WILLIAM HAANSTRA
October 1981 - May 31, 1984

PASSENGER PARTICIPATION AND COST DATA

PASSENGER NUMBER	DAILY RETURN DISTANCE	PARTICIPATION		PASSENGER KILOMETRES	PREVIOUS TRAVEL COST PER WEEK	COST WITHOUT VANPOOL PROJECT (DAYS/5) x COST/WEEK	ACTUAL COST USING THE VANPOOL PROJECT	SAVINGS NO VAN LESS VAN	SAVING PER WEEK
	Km	MONTHS	DAYS	Km x DAYS	$	$	$	$	$
1	20	31	641	12,820	10.00	1,282.00	0		
2	20	31	641	12,820	10.00	1,282.00	1,282.00		
3	20	24	496	9,920	10.00	992.00	992.00		
4	18	24	496	8,928	10.00	992.00	992.00		
5	18	31	641	11,538	10.00	1,282.00	1,282.00		
6	18	31	641	11,538	10.00	1,282.00	1,282.00		
7	16	31	641	10,256	10.00	1,282.00	1,282.00		
8	16	25	517	8,272	10.00	1,034.00	1,034.00		
9	16	31	486	7,776	10.00	972.00	972.00		
10	16	23	475	7,600	10.00	950.00	950.00		
11	16	19	392	6,288	10.00	784.00	784.00		
12	18	18	372	6,696	10.00	744.00	744.00		
13	16	12	248	3,968	10.00	496.00	496.00		
14	18	12	248	4,464	10.00	496.00	496.00		
15	16	12	248	3,968	10.00	496.00	496.00		
16	20	4	83	1,660	**	-			
TOTAL				128,512		14,366.00	13,084.00	$ 0.00	$ 0.00

$\bar{x}$ =

ASSUME: 21 DAYS / MONTH

★ USED THEIR OWN VEHICLE PRIOR TO VANPOOL PROJECT

★★ NEW EMPLOYEES

MILTON THIBODEAU
September 1, 1983 to May 31, 1984

PASSENGER PARTICIPATION AND COST DATA

PASSENGER NUMBER	DAILY RETURN DISTANCE	PARTICIPATION		PASSENGER KILOMETRES	PREVIOUS TRAVEL COST PER WEEK	COST WITHOUT VANPOOL PROJECT (DAYS/5) x COST/WEEK	ACTUAL COST USING THE VANPOOL PROJECT	SAVINGS NO VAN LESS VAN	SAVING PER WEEK
	Km	MONTHS	DAYS	Km x DAYS	$	$	$	$	$
1	150	9	189	28,350	25	945	0		
2	120	9	189	22,680	25	945	661.50	283.50	7.50
3	150	9	189	28,350	25	945	699.30	245.70	6.50
4	150	9	189	28,350	25	945	699.30	245.70	6.50
5	150	9	189	28,350	25	945	699.30	245.70	6.50
6	150	9	189	28,350	25	945	699.30	245.70	6.50
7	150	9	189	28,350	25	945	699.30	245.70	6.50
8	142	9	189	26,838	25	945	699.30	245.70	6.50
9	150	9	189	28,350	25	945	699.30	245.70	6.50
10	122	9	189	23,058	25	945	680.40	264.60	7.00
11	134	9	189	25,326	25	945	680.40	264.60	7.00
12	126	9	189	23,814	25	945	680.40	264.60	7.00
13	124	9	189	23,436	25	945	661.50	283.50	7.50
14	120	9	189	22,680	25	945	661.50	283.50	7.50
15	122	9	189	23,058	25	945	661.50	283.50	7.50
TOTAL				389,340		$14,175.	9,582.30	$647.70	$96.50

$\bar{x} = 6.80$

ASSUME: 21 DAYS / MONTH

★ USED THEIR OWN VEHICLE PRIOR TO VANPOOL PROJECT

★★ NEW EMPLOYEES